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BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte INTERNATIONAL BUSINESS MACHINES CORPORATION

Appeal 2017-001015
Application 13/675,872
Technology Center 2400

Before CARLA M. KRIVAK, BETH Z. SHAW, and AARON W. MOORE, *Administrative Patent Judges*.

MOORE, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant[1] appeals under 35 U.S.C. § 134(a) from a Final Rejection of claims 1–14, which are all of the pending claims. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

THE INVENTION

According to Appellant, "the invention relates to optimizing a stream application to selectively execute portions of code based on data flow rates." (Spec. ¶ 1.) Claim 1, reproduced below, exemplifies the subject matter on appeal:

> 1. A system, comprising:
>
> a computer processor; and
>
> a memory containing a program that, when executed on the computer processor, performs an operation for processing data, comprising:
>
> receiving streaming data to be processed by a plurality of interconnected processing elements, each processing element comprising one or more operators that process at least a portion of the received data;
>
> measuring a data flow rate in a data path between at least two operators in the plurality of processing elements;
>
> selecting, based on the measured data flow rate, an inactive code module stored in a first one of the plurality of processing elements processing the streaming data; and
>
> activating the selected code module on the first processing element such that the streaming data received by the first processing element is processed by the selected code module.

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[1] The named inventors are Michael J. Branson and John M. Santosuosso.

THE REJECTIONS

1. Claims 8–12 stand rejected under 35 U.S.C. § 101 as directed towards nonstatutory subject matter. (*See* Final Act. 4.)

2. Claims 1–12 stand rejected under 35 U.S.C. § 112, second paragraph, as indefinite for failing to particularly point out and distinctly claim the subject matter the applicant regards as the invention because "[c]laims 1, 3–4, 8, 10, and 13–14 recite the limitation 'the selected code module' and "[t]here is insufficient antecedent basis for this limitation in the claim." (*See* Final Act. 5.)

3. Claims 1–14 stand rejected under 35 U.S.C. § 102(b) as anticipated by Atsushi Ishii and Toyotaro Suzumura, *Elastic Stream Computing with Clouds*, 2011 IEEE International Conference on Cloud Computing, pp. 195–202 (July 2011) ("Ishii"). (*See* Final Act. 6–9.)

ANALYSIS

Section 101

The Section 101 rejection is not contested (*see* App. Br. 7) and is, therefore, summarily sustained.

Section 112

Claim 1 recites "selecting . . . an inactive code module stored in a first one of the plurality of processing elements processing the streaming data" and then "activating the selected code module on the first processing element." We find it sufficiently clear that "the selected code module" has as its antecedent the code module that was selected in the "selecting" step and, thus, decline to sustain the rejection of claims 1–12 as indefinite.

Section 102

The Examiner finds Ishii anticipatory of all claims. Appellant asserts that "*Ishii* does not teach 'selecting, based on the measured data flow rate, an inactive code module stored in a . . . processing element[] processing the streaming data and activating the selected code module.'" (App. Br. 9.)

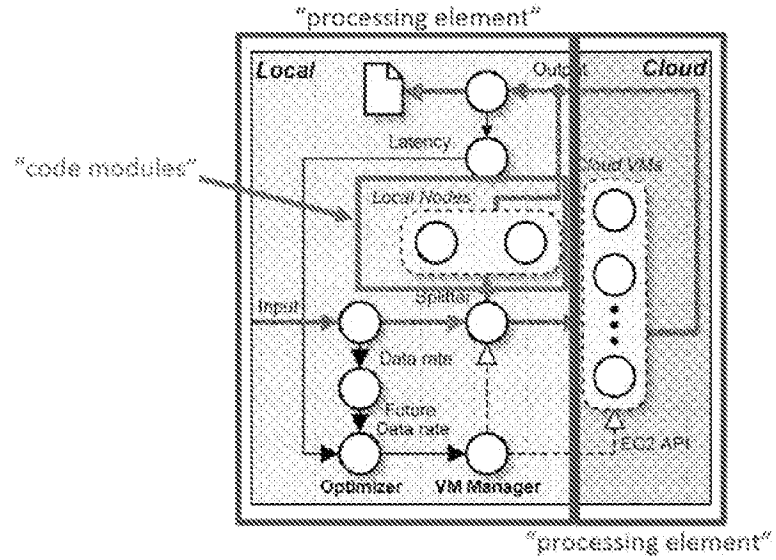
The Examiner responds that

> [Ishii's] local system and the cloud system each comprise a plurality of nodes. Based on a measured data rate, nodes are selected by a stream manager/splitter to handle the data stream. The local nodes are selected to handing [sic] the computational load until the data stream rate changes, exceeding the local capacity, at which point the processing of the data is transferred to the nodes of the cloud environment.

(Ans. 4, citing Ishii, Section III.A–C, pp. 197–199.)

Appellant replies that "the teachings in *Ishii* contradict the Office's assertion" because "*Ishii* teaches that a compute node hosts one or more processing elements," meaning that "the local processing system of *Ishii* has a plurality of local nodes each hosting one or more processing elements." Appellant continues that "[t]he Office's characterization would require the reverse relationship: *i.e.*, that a processing element (which the Office suggests is taught by the local processing system) hosts a plurality of nodes (the local nodes)" and that "such a characterization is contradicted by the teachings in *Ishii*." (Reply Br. 3.) Appellant also argues the "specification defines the terms compute nodes and processing elements such that the Office's assertion that a processing element can be read broadly enough to encompass an entire processing system is unreasonable." (*Id.*)

We are not persuaded of error. Figure 5 of Ishii is reproduced below, with annotations to reflect the Examiner's mapping of the claim elements.



Ishii's Figure 1, Annotated

As shown, Ishii's system "receiv[es] streaming data [at the input] to be processed by a plurality of interconnected processing elements [outlined in blue and red]," each of which necessarily includes "one or more operators that process at least a portion of the received data." Ishii's system "measure[es] a data flow rate"[2] and selects, and then activates, "an inactive code module [e.g., a local node] stored in a first one of the plurality of processing elements processing the streaming data." This is described in Section III.A:

> The application flow in the system can be broken down into three parts, first receiving the incoming data stream, then splitting the data up for multiple computational nodes, and finally processing

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[2] As Appellant does not argue the claim language "in a data path between at least two operators in the plurality of processing elements," any argument that Ishii does not measure dataflow "between at least two operators" is waived.

> it in parallel. The system also adds computational nodes in the cloud environment by spawning an appropriate number of virtual machines if the local environment is overloaded.

As the Examiner finds, "one of ordinary skill would understand that during the normal course of operation, Ishii's local nodes would not always be active and would go through periods of activity and inactivity." (Ans. 5.)

Appellant's argument challenges the mapping of the claim term "processing element" to the local and cloud elements identified above. The ordinary meaning of Appellant's claims, however, does not require that the processing elements be within a node. Instead, they only require processing elements that comprise operators and code modules stored in the processing elements.

Because the plain language of the claims does not require the relationship urged by Appellant, the question is whether "processing element" is either a term of art describing a component of a node or is defined in the specification to have that meaning. Regarding the art in general, we find Ishii's use of "processing element" (a combination of two very common words) to describe a part of a node insufficient to preclude the local and cloud elements from *also* being "processing elements." The record lacks sufficient evidence that this term has a unique, narrow meaning in this field. Nor do we agree with Appellant that the specification's use of the term in its description of one embodiment "defines" the term, as "[i]t is not enough for a patentee to simply disclose a single embodiment or use a word in the same manner in all embodiments, the patentee must clearly express an intent to redefine the term." *Thorner v. Sony Computer Entertainment America LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012).

Because we find Appellant's arguments unpersuasive, we sustain the Section 102(b) rejection of claims 1–14.

DECISION

The rejection of claims 8–12 under 35 U.S.C. § 101 is affirmed. The rejection of claims 1–12 under 35 U.S.C. § 112, second paragraph, is reversed. The rejection of claims 1–14 under 35 U.S.C. § 102(b) is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED